

REMARKS

Objection to the Claims

Claim 30 is objected to for its recitation of substitution of the styrenic unit, while claims 22 already recites functionalization of some of the styrenic units. In the context of the present invention, a styrenic unit can be substituted without being functionalized and a styrenic can have a substitution without being functionalized – the two words/actions are not equivalent. One example, provide by way of explanation and not intended to limit the present invention, a substitution of methyl may be provided on the styrenic unit or the styrenic unit may be functionalized via the inclusion of the recited acid

Obviousness-type Double Patenting

All pending claims have been rejected under the doctrine of obviousness-type double patenting over claims 1-45 of copending Application No. 11/293561 (Attorney docket number 2005B148).

As the later filed application is still pending and remains subject to prior art rejections, as does this application, there remains the possibility of this rejection being the sole remaining rejection which, as noted in MPEP 804IB1, must then be withdrawn and the present case allowed to grant.

Applicant request deference of arguments regarding this rejection, pending resolution of the outstanding prior art rejections.

35 U.S.C. § 103

All pending claims stand rejected under 35 U.S.C. § 103 as being obvious over Elspass (US 5807629) in view of Wang (US 5621044). To the extent the amended claims are deemed unpatentable over the cited prior art, these rejections are traversed for the following reasons.

Elpass teaches a nanocomposite elastomer comprising an 1-25 wt% of an organoclay, wherein the nanocomposite may be further blended with various additives, such as curatives and addition fillers, for use as tire innerliners. In col 2, lines 18-23, Elspass discloses a list of possible compounds with which to

functional an *isoprene* copolymer, including anhydrides – but *not* styrene. For such functionalization, the functional unit is grafted to the isoprene in the copolymer. In col 2, lines 27-31, Elspass discloses for functionalized para-methyl styrene copolymers, the functional group will typically be a halogen.

Example 12 discloses a styrenic containing isobutylene copolymer – however, the copolymer is acrylated – distinct from the recited grafted compound comprising two double bonded oxygen. Example 14 discloses another modified styrenic containing isobutylene copolymer wherein the copolymer is sulfonated – again, distinct from the recited grafting compound.

Regarding amended independent claim 1, Elspass fails to teach or direct those skilled in the art to modify the taught copolymers with the functional group as presently recited. The listed possibility of functional groups that may be added to the copolymers fails to include a non-cyclic compound having two double bonded oxygens as presented recited.

Regarding amended independent claim 72, the other independent composition/product claim, Elspass fails to teach or suggest modifying the isobutylene-styrenic copolymer with one of the recited maleates.

Regarding independent method claim 22, the teachings of Wang are incorporated in the rejection to provide teachings regarding the formation of the functionalized copolymer. Wang is cited as teaching the use of peroxide as the grafting agent, as recited in claim 22. Applicants disagree.

In forming the modified copolymer, Wang teaches the “nucleophile,” i.e. the functionalizing compound, and the copolymer are dissolved in a solution or dispers “so as to achieve intimate contact between the *benzylic halogen* of the base polymer and the nucleophile” (emphasis added; col 8, lines 7-13) and this occurs under conditions “so as to avoid the formation of crosslinked or gelled products and minimize unwanted side reactions” (col 8, lines 18-20).

In the examples provided of forming a functionalized copolymer, both examples are halogenated polymers, so as to achieve the functionality at the benzene bromide as taught by Wang.

The peroxides of Wang at col 9 cited in the rejections are peroxides used in crossing linking and curing of the blend of functionalized copolymer and other copolymer; these are not used for grafting the copolymer.

One skilled in the art looking to learn how to graft functional compounds to a copolymer that does not have any benzylic halogens would not look to the teachings of Wang.

Furthermore, contrary to any assertion in the rejection, Wang fails to teach the usefulness and applicability of the elastomer to be blended with a nanoclay to form a nanocomposite.

In the single example of Elspass, Example 13, wherein peroxide is disclosed, the copolymer fails to have any styrenic units.

The prior art, even when taken in the best light, fails to address or teach those skilled in the art either the recited nanocomposites comprising a non-halogenated copolymer comprising styrenic units and maleates and fails to teach those skilled in the art to form such compounds using peroxides to graft the functional compound as recited in claim 22.

In light of this amendment, Applicants are of the position that all of the claims now pending in the subject patent application are allowable. Thus, the Examiner is respectfully requested to allow all pending claims. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

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ExxonMobil Chemical Co.
Law Technology
P.O. Box 2149
Baytown, Texas 77522-2149
Phone: 281-834-2429
Fax: 281-834-2495

Respectfully submitted,

/Nancy T. Krawczyk/
Nancy T Krawczyk
Attorney for Applicants
Registration No. 38,744